ATOMIC ENERGY Letter

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Dear Sir:

Under the USAEC program whereby U.S. firms might participate in reactor development projects, four groups of such organizations have now submitted proposals for special studies of the practicability of business and industry building and operating nuclear reactors for the production of fissionable materials and power. The proposals were submitted by: (a) Monsanto Chemical Co., St. Louis, and the Union Electric Co. of Missouri, St. Louis: (b) The Detroit Edison Co., Detroit, and the Dow Chemical Co., Midland, Mich. (c) The Commonwealth Edison Co. and the Public Service Co. of Northern Illinois, of Chicago; (d) Pacific Gas and Electric Co. and the Bechtel Corp., San Francisco. Arrangements have already been signed with some of these groups, while negotiations are continuing with others. With these four proposals, the USAEC has now stated that no further proposals will be considered, because of the extra load that will be placed on Argonne National Laboratory, Chicago, and Oak Ridge National Laboratory, Oak Ridge, by this work. Both these laboratories already have heavy development programs of high importance in national defense. In general, the terms of the agreements executed with the Dow Chemical-Detroit Edison group, and with the Commonwealth Edison-Public Service of Northern Illinois group provide that the companies will make a survey and study of the Commission's reactor development activities. Objectives will be: (1) To determine the engineering feasibility of their designing, constructing and operating a materials and power producing reactor, (2) To examine the economic and technical aspects of building this reactor in the next few years, (3) To determine the research and development work needed, if any, before such a reactor project can be undertaken, (4) To offer recommendations in a report to the USAEC concerning such a reactor project, and industry's role in undertaking and carrying it out. All costs are to be borne by the companies with the exception of the costs to the USAEC and its contractors in making information and technical services available. Distribution of the final report submitted on the project will be determined by the USAEC.

An increase in the capital stock of Tracerlab, Inc., Boston nuclear products firm, from 275,000 to 450,000 shares, has now been voted by that concern's stockholders, according to William E. Barbour, Jr., Tracerlab president. Barbour said proceeds of the new issue would be used for expansion purposes and to retire certain loans incident to Tracerlab's recent acquisition of Kelley-Koett Mfg. Co., Covington, Ky. Tracerlab's first quarter sales, this year, were in excess of $800,000.00, Barbour stated, while the company has a current backlog of both civilian and government orders estimated at $3,000,000.00. He also pointed out that Kelley-Koett's first quarter sales reached nearly $2,000,000.00 this year.

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NEW PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear work...

Anticoincidence analyzer, for use with improved Libby screen-wall counter or other type of counter tube. Using proper shielding to reduce background, manufacturer states this analyzer (model 503B) can be used for extremely low-level tracer work. Low-level tritium studies are said to be possible with this instrument, and to give more sensitive results than mass spectrometer methods. By using a combination of an improved Libby screen-wall counter, with the 503B, it is said that an efficient low-level Beta counter is obtained.--Atomic Instrument Co., Cambridge 39, Mass.

Scintillation scaler, NRD model S-1001, for Geiger and proportional counting. Incorporates three basic features: (1) A fast linear amplifier with a rise time of 0.25 microseconds and a variable amplification from 0 up to 2000; (2) a true electronic discriminator which accepts pulses from minus 100 to plus 50-volts; and (3) a well regulated high-voltage supply which is variable from 500 to 2000 volts and is regulated to .005% per 1 volt change in line voltage between 95 and 130-volts. Scaler portion use Higinbotham scale of 128, which incorporates 6SN7 tubes and has resolving time of 2 microseconds. Interpolation lights, a 6 digit electromagnetic register, and a 60 cycle test switch for checking scaler performance are mounted on an aluminum front panel.--Nuclear Research and Development, Inc., 1094 Sutter Ave., St. Louis 5, Missouri.

ATOMIC PATENT DIGEST...latest U.S. applications & grants...

Fluorophotometer. Comprises an elongated tubular enclosure, a source of ultra-violet light radiation positioned in this enclosure adjacent one extremity, and a fluorescent sample adapted to be excited by the source in an intermediate position of the enclosure. A light sensitive device is positioned in this inclosure at its other end, while a reflector directs light rays from the source upon the sample to produce fluorescence. In addition, there is a reflector for directing the fluorescence upon the light sensitive device. U. S. Pat. No. 2,551,542, issued May 1, 1951; assigned to United States of America (USEAC).

Production of uranium peroxide. The process of producing uranium peroxide of a highly desirable character from uranyl sulfate solution. Comprises adding hydrogen peroxide to an acqueous uranyl sulfate solution to convert the hexavalent uranyl salt to uranium peroxide and simultaneously adding sodium hydroxide with the hydrogen peroxide to maintain a pH between 2.5 and 4. U. S. Pat. No. 2,551,543, issued May 1, 1951; assigned to United States of America (USEAC).

NOTES: The Patent Compensation Board of the USEAC has now denied the claim for compensation of A. A. Matheson, based upon Matheson patent 2,504,839. This patent showed a simple mechanical device for operating a pneumatic valve to produce short, rapid bursts of air from an air stream. In denying the claim, the Board stated "there is no suggestion of any use by the USAEC of the device shown in the patent, and no suggestion of how the apparatus could be employed in the activities of the USAEC".

BOOKS & OTHER PUBLICATIONS...in the nuclear field...

Atomic Physics for Engineers, by Saul Dushman, consultant, General Electric Research Laboratories. Covers recent advances including the development of atomic energy and the production of high voltage particle accelerators. Presents the essential concepts and applications of atomic and nuclear behavior, using only the most elementary calculus and emphasising experimentally observed phenomena. --McGraw-Hill Book Co., Inc., New York 18.

The Properties and Possible Uses of Fission Products, by Paul M. Cook, chemical engineer and Management Considerations in the Use of Mission Products, by W. E. Hoskens, industrial market analyst are staff papers of Stanford Research Institute, Stanford, Calif., presented before the "Radioisoptopes in Industry" conference, recently held at Case Institute, Cleveland,. These papers may be obtained from Stanford Research Institute, Stanford, Calif., by addressing the Public Relations Office.

RAW MATERIALS...radioactive ores and other materials for nuclear work...

CANADA-Experience gained in the three years of public participation in the search for uranium in Canada (and the almost double that time which the government's Eldorado Mining & Refining has spent on the search) formed the background for much of the detailed data on uranium mining in Canada that the Prospectors and Developers Association recently heard at their annual meeting here.

Geologists, and other experts, told the meeting that uranium is as easy, or easier, to prospect and find than other metals. So far, the most promising area located is the Goldfields region, encompassing the Beaverlodge Lake section, on the north shore of Lake Athabaska in northern Saskatchewan. In addition, worthwhile showings have been uncovered in other parts of the country, the Northwest Territories, the Sault Ste. Marie area on the east shore of Lake Superior and in south central British Columbia.

Many technical problems have been overcome. Now, a cheap and quick method of assaying is available; this had been one of the early difficulties. Further, the treatment of uranium ores is now no more difficult than the treatment of cobalt ores and arsenical gold ores. As to the equipment required: it is quite similar to that employed for base metals or for cyanidation of gold ores. Experience has also shown that capital cost of plant and cost of treatment should not be greatly in excess of corresponding costs for base metals.

An authoritative report on radioactive occurrences was given by Dr. A. L. Lang, Geological Survey of Canada. Dr. Lang stated that showings of 0.05% uranium oxide or equivalent (or better) have been recorded on 502 properties. He said that in almost all cases the radioactivity is due to pitchblende. As to the number of radioactive occurrences, they total 3,200 of which 2,400 are in the Goldfields area, Dr. Lang estimated. Of these, 13 are what he terms Class A properties i. e., those that warrant an all-out exploration and development program to determine their true worth. Class B properties--those which are considered worth at least a limited expenditure to test their possibilities--are estimated at 53, in the Goldfields area. This suggests that in the Goldfields area there are now about 100 properties with promise sufficient to warrant the expenditure of development funds.

In the Sault Ste. Marie area, over 30 widely spaced showings have been located. Geologists consider this good evidence that the district offers promise of important finds.

As was pointed out by W. J. Bennett, president of Eldorado Mining & Refining, the bulk of Canadian production is sold to the United States Atomic Energy Commission. The Canadian price structure must, therefore, be worked out with the USAEC. Now, Mr. Bennett said, prices paid for uranium in the United States, and in Canada, are approximately the same. However, a completely different basis to determine price is used in the two countries. The U. S. formula was designed primarily to meet conditions on the Colorado Plateau. There, uranium is found in association with vanadium, which for years has been mined from numerous small deposits and shipped to central mills for treatment. Thus, the U. S. schedule is based on the purchase of uranium oxide in raw ore. Under the Canadian schedule, prices are based on the purchase of uranium oxide in a mill concentrate or a cobbed high grade ore.

UNITED STATES - Continuing activity marks the carnotite fields of the Colorado Plateau, the area of greatest U.S. uranium output. Now, all five processing plants are working at full capacity in this area. One new plant is in operation, and others are in the preliminary stages. At Grand Junction, Colo., Climax Uranium Company has designed and built a plant for maximum uranium recovery with vanadium production of secondary importance. Of interest, is that this is the first mill to be built in the U.S. primarily for uranium recovery. Previously, all domestic uranium had been recovered as a by-product from mills originally built to recover vanadium, or from modified or rebuilt vanadium mills processing Colorado-Plateau vanadium-uranium ores.

Geologists of this region have pointed out that there are two general areas here which promise to be large producers of uranium ore: the White and Red Canyon area, located west of Blanding, Utah; and the Temple Mountain District, located in the San Rafael uplift region south and west of Greenriver, Utah.

THE ATOMIC ENERGY ENTERPRISE OF THE UNITED STATES: A special digest, prepared for readers of this NEWSLETTER, of remarks by T. Keith Glennan, Commissioner, USAEC, at Ohio Newspaper Seminar, Cleveland, Ohio, May 11, 1951

The atomic energy enterprise of the United States includes major research centers at Brookhaven and Schenectady, New York; at Chicago, Ill.; at Ames, Iowa; at Los Alamos, N.M.; at Oak Ridge, Tenn.; and at Berkeley, Calif. There is also the 400,000-acre reactor testing station at Arco, Idaho, and the production facilities at Hanford, Wash., and at Oak Ridge, Tenn. In Ohio alone there is the Miamisburg Laboratory, near Dayton; the uranium processing operation of the Harshaw Chemical Co., Cleveland; the beryllium plant (Brush) at Luckey, near Toledo; 19 research projects at universities and private laboratories, and a number of smaller industrial contractors.

More than 80,000 persons are employed in this program; about 5,200 are on the USAEC's payroll. The rest work for our contractors.

The money that has been expended for plant and equipment alone will amount to $2.5 billion by June 30, 1951. This puts the USAEC in third place among the top U. S. industrial enterprises; only A. T. & T., and U. S. Steel exceed it in capital investment.

Not only is the USAEC large; it is getting larger. It is now in the midst of a program of expansion of its facilities which will eventually cost nearly $2 billion. Under this program, new construction is being carried on at practically every existing installation, and in addition such new facilities are being started as a $900 million production plant in South Carolina (materials for hydrogen bomb); a $500 million production plant in Kentucky; and a number of lesser plants in various other parts of the country.

Today, with the country in a period of national emergency, the USAEC's principal objectives are the production of atomic weapons, in the greatest possible numbers, and of the best possible design. Over 80% of the funds spent go for that purpose.

Here are the main fields of endeavor of the USAEC: (1) Acquisition of uranium ore. This ore is bought by the USAEC, wherever it is offered to us, at home or abroad. By means of a bonus offer, guaranteed minimum prices, and an exploration program, the USAEC attempts to stimulate domestic production as much as possible. Although no high-grade commercial deposits of uranium ores have as yet been found in the United States, the U.S. is now in second place among the world's uranium producers, with the Belgian Congo in the number one position.

(2) We process this uranium ore to degrees of extreme purity. This is a fairly straightforward process, and is done by a number of different industrial contractors to the USAEC located in various parts of the country. The capacity for doing this has been steadily increased to keep pace with increased ore supplies, and unit costs have been cut just about in half during the past four years.

(3) There is the production from this purified uranium metal of the fissionable materials plutonium and uranium-235. Produced at Handford and Oak Ridge, capacity will be further increased by the South Carolina and Kentucky plants, now under construction.

(4) These fissionable materials are utilized in the production of atomic weapons.

(5) The development of nuclear reactors is yet another of the USAEC's fields of endeavor. It is designed to use fissionable materials for the production of power for useful purposes.

(6) Additionally, there is a program for the production and distribution of radioisotopes produced in the USAEC's nuclear reactors.

(7) Lastly, there is the research program. It attempts to add to the basic knowledge of nuclear forces; to make production processes more efficient; to protect the health and safety of the workers; and to find a wider variety of "peaceful uses for the atom".

Sincerely,

The Staff,
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